

### **The Relationships Between Teachers' Beliefs, Technology Perceptions, Pedagogy, and Technology Use**

This research sets out to show how technology adoption is guided by teacher's beliefs, technology perceptions, and pedagogy. The importance of this study is to gain a greater appreciation for why more teachers are not using technology in ways advocated in the literature and to facilitate uses that lead to increased student learning (Ertmer, 2005). Put into a practical context, this study will show why teachers even next-door to each other in the same school building will elect to use technology as part of their instruction and others do not adopt technology despite the same training, support, and available hardware. This is an important distinction to make since training, support, and quality and quantity of technology is mentioned in much of the research surrounding technology adoption (Li, 2007; Rakes, Fields, Cox, 2006).

The process a teacher engages to adopt technology as part their instruction can be viewed as having two primary influencers: (1) beliefs about teaching, learning, students and pedagogy and (2) the perception of technology's role in education (Li, 2007). Addressing the first influencer, beliefs are commonly used as the focal point of research since they are considered the filters for teachers' instructional and curricular decisions (Levin & Wadmany, 2006). The role of technology as an instructional and learning tool in the classroom can be influenced by teacher's personal use of technology and the teacher's belief system (Rakes, Fields, Cox, 2006; Levin & Wadmany, 2006).

Teacher's adoption of technology as a learning and instruction tool is linked to their beliefs on epistemology or how knowledge is acquired (Levin & Wadmany, 2006). Teachers who have a more-traditional, rigid based approach to teaching and learning generally avoid technology adoption. Conversely, teachers who believe in more open, student-created/centered knowledge models of learning, adopt technology more readily (Levin & Wadmany, 2006). Interestingly, the manner in which technology is presented – teacher-centered and student-centered – impacts those teachers who hold differing pedagogical views (Ertmer, 2005). This distinction of differing pedagogical beliefs is pointed out in a study juxtaposing the differences in the perceptions of technology between students and teachers. Teachers who practiced “the basics” didn't want to waste “time on technology integration” (Li, 2007). However, teacher's beliefs are not permanent, hardened systems. Their belief systems in regards to technologies and pedagogy can be symbiotic albeit complex (Levin & Wadmany, 2006). The richness of the technology (support, quality, quantity) environment and the technology-centric activities can change a teacher's beliefs and values in learners and pedagogy. (Levin & Wadmany, 2006)

The implications of this study can be profound from a global economy perspective as noted in Thomas Friedman's (2006) The World is Flat and in the work of The Partnership for the 21<sup>st</sup> Century. Students must be able to use technology to learn content and skills — so that they know *how* to learn, think critically, solve problems, use information, communicate, innovate, and collaborate (21<sup>st</sup> Century, on-line). These skills are not abstract; rather, they begin with a teacher's belief system that is conducive to technology adoption.

Local implications of this study can be just as significant on the impact on student learning. Understanding the effects of the impact on technology adopted based on teachers' beliefs and preferred pedagogical methods, can shape the nature of teacher inservice training, the approaches used to introduce teachers to those tools, district expectations, and the allocation and planning of resources and budget monies. At the instructional level, the origin of this research, understanding beliefs can greatly assist technology specialists (coaches, coordinators) with increasing technology adoption.

### **Further Questions**

Do technology tools themselves have or lean towards a pedagogical orientation?

What creates a technology-rich environment that serves as a catalyst for teacher belief and pedagogical changes?

How are teacher's beliefs formed?

What are other influencers of teacher's technology adoption?

### **Conceptual Independent Variable**

Teacher technology adoption

### **Conceptual Dependent Variable**

Teacher beliefs about pedagogy

Teacher beliefs of technology

Teacher beliefs of student learning (epistemology)

Teacher beliefs of education

### **Conceptual Hypotheses**

Introducing technology to teachers at inservice commensurate with their prevailing teaching styles and beliefs will increase the chances of sustained technology adoption in their classrooms.

Teachers in a technology-rich environment can shift their beliefs and pedagogical views about technology moving from a more rigid, positivist style of teaching to a constructivist style of teaching using technology as tool for learning and instruction.

Teacher's beliefs in the adoption of technology can have an impact on the acquisition of 21<sup>st</sup> century skills, district and school technology operations, and at the classroom level.